The Fire Potential Index

SDG&E has developed a comprehensive assessment tool, known as the "Fire Potential Index" (FPI) that is used as a tool for making operational decisions which will reduce fire threats and risks. This tool converts environmental, statistical and scientific data into an easily understood forecast of the short-term fire threat which could exist for different geographical areas in the SDG&E service territory. The FPI is issued for a seven-day period, and provides SDG&E personnel time, during which they may plan and prepare accordingly.

The FPI reflects key variables such as the state of native grasses across the service territory ("green-up"), fuels (ratio of dead fuel moisture component to live fuel moisture component), and weather (sustained wind speed and dew point depression). Each of these variables is assigned a numeric value and those individual numeric values are summed to generate a Fire Potential value from zero (0) to seventeen (17) , each of which expresses the degree of fire threat expected for each of the seven days included in the forecast. The numeric values are classified as "Normal", "Elevated", and "Extreme".

The state of native grasses, or "Green-Up Component", of the FPI is determined using satellite data for various locations. This component is rated on a 0-to-5 scale ranging from very wet (or "lush") to very dry (or "cured"). The scale is tied to the NDVI, which ranges from 0 to 1,[1] as follows:

FPI Green-Up Component

Very Wet/Lush: 0.65 to 1.00	0.60 to 0.64	0.55 to 0.59	0.50 to 0.54	0.40 to 0.49	Very Dry/Cured 0 to 0.39
0	1	2	3	4	5

[1] The Normalized Difference Vegetation Index ("NDVI") is a simple graphical indicator that can be used to analyze remote sensing measurements, typically but not necessarily from a space platform, to assess whether the target area under observation contains live green vegetation or not. More information on the NDVI scale is available at the following address: http://en.wikipedia.org/wiki/Normalized_Difference_Vegetation_Index.

The Fuels Component of the FPI measures the overall state of potential fuels which could support a wildfire. Values are assigned based on the overall state of available fuels (dead or live) for a fire using the following equation:

$$FC = FD / LFM$$

Where FC represents "Fuels Component" in the scale below, FD represents Fuel Dryness Level (using a 1-to-3 scale),[2] and LFM represents Live Fuel Moisture (percentage).

The product of this equation represents the fuels component that is reflected in the FPI as follows:

FPI Fuels Component

Very Wet					Very Dry
1	2	3	4	5	6

The weather component of the FPI represents a combination of sustained wind speeds and dew-point depression as determined using the following scale:

FPI Weather Component

Dewpoint/Wind	≤4 knots	5 to 9	10 to 14	15 to 19	20 to 24	>24 knots
>50ºF	2	3	3	4	5	6
40ºF to 49ºF	2	2	3	3	4	5
30ºF to 39ºF	1	2	2	3	3	4

[2] These values are taken from the Southern California Geographic Area Coordination Center, an interagency support center for fire protection and suppression. More information regarding this agency can be found at the following address: http://gacc.nifc.gov/oscc/ .

20ºF to 29ºF	1	1	2	2	3	3
10ºF to 19ºF	0	0	1	1	1	1
<10ºF	0	0	0	0	0	0

The individual numeric values representing the three variables reflected in the FPI, shown above, are combined and placed on the following scale:

Fire Potential Index (FPI)

Normal	Elevated	Extreme
≤ 11	12 to 14	≥ 15

The FPI was developed by a team made up of SDG&E meteorologists, fire coordinator, and statistical analysts. The team has validated the FPI values and their usefulness by recreating historical values for the past ten (10) years. The historical results bore a very strong correlation to actual fire events in terms of the severity of past fires and, in particular, provided very accurate information as to when the risks of uncontrolled and large-scale wintertime fires were high. SDG&E expects to tie proactive and reactive operational practices and measures to the FPI values, with the further expectation that SDG&E will be able to reduce the likelihood its facilities and operations will be the source of ignition for a fire during times when the risk of fire as measured by the FPI elevated or extreme.